b. Amendments to Claims

1. (Currently amended) An apparatus, comprising:

a non-fiber optical element having a first optical aperture;

an endoscopic probe having first and second ends, the probe comprising a compound GRIN lens configured to carry illumination light ~~over about~~ along the length of the probe, the compound GRIN lens including first and second serially coupled GRIN lenses of different pitch, the first end being positioned to receive the illumination light from the first optical aperture; and

a detector configured to measure values of a characteristic of light emitted from the first end in response to multi-photon absorption events produced by the illumination light in a sample, the detector configured to produce an output signal for a multi-photon image of the sample.

2. (Currently amended) The apparatus of claim 1, wherein the probe further comprises a prism connected to an end of the compound GRIN lens.

3. (Currently amended) The apparatus of claim 2, wherein the compound GRIN lens has pitch length of about one or more.

4. (Currently amended) The apparatus of claim 1, wherein the first GRIN lens is ~~further comprises:~~ a relay GRIN lens [[;]] and the second GRIN lens is an objective GRIN lens ~~being~~ serially coupled to the relay GRIN lens; and

wherein the objective GRIN lens has a shorter pitch than the relay GRIN lens.

5. (Original) The apparatus of claim 4, wherein the relay GRIN lens is coupled to receive light from the first optical aperture and transmit the received light to the objective GRIN lens.

6. (Original) The apparatus of claim 4, wherein the pitch of the objective GRIN lens is at least five times shorter than the pitch of the relay GRIN lens.

7. (Currently amended) The apparatus of claim 1, wherein the compound GRIN lens ~~further~~ comprises:

a relay GRIN lens; and

an objective GRIN lens being serially coupled to one end of the relay GRIN lens; and

a coupling GRIN lens being serially coupled to an opposite end of the relay GRIN lens as the objective GRIN lens; and

wherein the objective GRIN lens and the coupling GRIN lens have shorter pitches than the relay GRIN lens.

8. (Currently amended) The apparatus of claim 7, further comprising:

a pulsed laser; and

wherein the compound GRIN lens and optical element are configured to deliver source light from the pulsed laser to the sample without the source light propagating in single mode optical fiber.

9. (Original) The apparatus of claim 1, further comprising:

a pulsed light source coupled to transmit light pulses to the optical element; and

wherein the detector is configured to measure a quantity indicative of an intensity of the light emitted from the first end.

10. (Original) The apparatus of claim 9, wherein the detector is configured to measure a characteristic of light whose wavelength is shorter than a wavelength of the light produced by the source.

11. (Original) The apparatus of claim 1, further comprising:

a processor configured to produce a scan image from the measured values and estimated positions of the multi-photon absorption events.

12. (Currently amended) The apparatus of claim 1, wherein the compound GRIN lens forms an endoscopic probe.

13. (Currently amended) A process for scanning a region of a sample with a probe having a compound GRIN lens with first and second end faces, comprising:

positioning the first end face of the compound GRIN lens near the region of the sample, the compound GRIN lens including first and second serially coupled GRIN lenses of different pitch;

transmitting light to the second end face of the compound GRIN lens such that the compound GRIN lens carries the light ~~about~~ along the length of the probe; and

scanning one of an incidence position and an incidence angle of the light on the second end face of the compound GRIN lens while performing the transmitting to generate a scan of the region of the sample.

14. (Original) The process of claim 13, further comprising:

receiving light emitted by the region of the sample in response to the scanning; and

measuring values of a quantity indicative of an intensity or a phase of the emitted light in response to the receiving.

15. (Original) The process of claim 14, further comprising:

forming an image of the region of the sample from the measure values and positions of portions of the sample that produced the emitted light.

16. (Currently amended) The process of claim 14, wherein the receiving comprises collecting the emitted light through the first end face of the compound GRIN lens.

17. (Original) The process of claim 14, wherein the quantity is indicative of the intensity of the emitted light.

18. (Original) The process of claim 14, wherein the transmitting comprises sending a series of pulses of laser light to the second end face.

19. (Original) The process of claim 13, wherein the positioning causes the first end face to be located in the sample and the second face to be located outside the sample.

20. (Previously presented) The process of claim 14, wherein the measuring includes determining the values of the quantity for light whose wavelength is shorter than the wavelength of the transmitted light.

21. (Previously presented) The process of claim 13, wherein the act of transmitting causes the transmitted light to be transmitted through a relay GRIN lens and then, to be transmitted through an objective GRIN lens that is serially coupled to one end of the relay GRIN lens.